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Memorandum

TO: Air Quality Conformity Task Force DATE: May 30, 2008

FR: Ashley Nguyen & Chuck Purvis W. I.

RE: Approach to the Conformity Analysis of the Transportation 2035 Plan and 2009 Transportation Improvement Program Amendment #09-XX

MTC will prepare a conformity analysis for the Transportation 2035 Plan (T2035), which is a long-range transportation plan aimed at addressing the mobility and accessibility needs of the Bay Area over the next 25 years. The conformity analysis will cover the financially constrained element of T2035. Note that the SMART and Napa and Santa Clara Counties may have tax measures on the November 2008 ballot, and should these measures pass, the financially constrained plan will include those investments that become fully funded as a result. In addition, the conformity analysis for T2035 will be used to re-determine conformity for the entire 2009 Transportation Improvement Program (TIP) with Amendment #09-XX. This Amendment #09-XX will accommodate a set of exempt and non-exempt projects from T2035 that would move into the TIP timeframe of FY 2008-09 through FY 2011-12.

Key aspects of the conformity analysis are as follows:

1. MTC will use the latest planning assumptions, including the socio-economic/land use forecast series *Projections 2007* developed and adopted by ABAG in Fall 2006. ABAG staff prepares master databases at the 1,405 census tract-level, and MTC staff then disaggregates these tract-level forecasts to MTC's 1,454 travel analysis zone system. A report on Projections 2007 data, at the MTC 34 superdistrict and nine county level, is available at MTC's FTP site:
   ftp://ftp.abag.ca.gov/pub/mtc/planning/ZoneData/Proj2007/Proj_2007_Data_Summary_Aug2007.pdf
   Note that the next round of socio-economic forecasts (*Projections 2009*) will be available in mid-2009, after the adoption of the Transportation 2035 Plan in early 2009.
2. MTC will use the latest validated version of the MTC travel demand model (BAYCAST).
3. The analysis years will be 2006, 2007, 2015, 2025 and 2035 with implementation dates for T2035 and 2009 TIP Amendment #09-01 projects to be reaffirmed. The 2006 analysis year represents the attainment year for the 1-hour ozone standard, while the 2007 analysis year is the attainment year for the 8-hour ozone standard.
4. MTC will use the 1-hour motor vehicle emissions budget from the 2001 Ozone Attainment Plan as the 8-hour motor vehicle emissions budget to demonstrate conformity with the 8-hour ozone standard (as was done for the Transportation 2030 Plan).
5. MTC will use the new carbon monoxide (CO) motor vehicle emissions budget from the *2004 Revision to the California State Implementation Plan for Carbon Monoxide, Updated*

Maintenance Plan for Ten Federal Planning Areas to determine conformity with the CO standard.

6. The motor vehicle emissions estimates will include the effects of TCMs A-E in the 2001 Ozone Attainment Plan. These TCMs are now fully implemented.
7. EMFAC2007, which is the latest approved set of motor vehicle emission rates from CARB, will be used. MTC will apply EMFAC2007 model system, in "BURDEN" mode, to produce emission estimates. We will work with CARB and BAAQMD staff to ensure the correct use and application of the EMFAC/BURDEN model system, and any necessary post-processing adjustments that may be required or recommend by CARB or BAAQMD staff.
8. VMT forecasts will be consistent with CARB assumptions for the Bay Area. The source data will be MTC's average weekday daily travel forecasts of VMT by the CARB 13 speed "bins", by county-of-occurrence, by five time periods: early morning (0000-0600 military time), AM peak (0600-1000), midday (1000-1500), PM peak (1500-1900), and evening (1900-2400). This "time period daily traffic assignment approach" is a new methodology as of mid-2007, and was first used in the Transportation 2035 vision scenario analysis conducted in Fall 2007.
9. Highway and transit networks will be updated for each analysis year, and the network definitions will be documented as part of the conformity analysis.
10. The pricing assumptions to be used in the travel forecasts are detailed in Attachment A.

The key project milestones for the conformity analysis are shown in the table below:

Dates	**Key Project Milestones**
June 9, 2008	Air Quality Conformity Task Force Meeting *(Agenda topics: Approach, assumptions, and schedule for new conformity analysis of the T2035 Plan and 2009 TIP Amendment #09-01)*
July 30, 2008	Approval of Draft Financially Constrained Investment Plan by Commission
Aug - Nov 2008	Technical Analysis & Report Preparation
December 12, 2008	Release of Draft T2035 Plan & EIR by the Commission for public review
December 16, 2008	Air Quality Conformity Task Force Meeting *(Agenda topics: Review of Administrative Draft Conformity Analysis)*
January 9, 2009	Release of Draft Conformity Analysis by the Planning Committee for 30-day public review (close of comment is February 9)
February 18, 2009	Air Quality Conformity Task Force Meeting *(Agenda topics: Review Response to Comments & Proposed Final Conformity Analysis)*
March 13, 2009	Approval of Final T2035, EIR & Conformity Analysis by Planning Committee
March 25, 2009	Final Approval of Final T2035, EIR, & Conformity Analysis by Commission
March 26, 2009	Transmit Final Conformity Determination to FHWA/FTA for approval

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Attachment A
Pricing Assumptions

Pricing Assumptions

The standard set of pricing assumptions used in MTC travel forecasts relate to auto costs (parking, bridge tolls, auto operating costs, fuel economy) and transit fares.

a. Parking Costs

Base year 2000 and forecast year 2035 parking costs, peak period and off-peak period, are shown in **Table 1**. Data is shown for only zones with non-zero parking costs.

The standard methodology for forecasting future year parking costs is to use the ratio of future year gross employment density (jobs/acre) to base year gross employment density, multiplied by the base year parking price. All costs in the MTC model system are represented in 1990 constant dollars, but the last column in Table 1 shows the "average monthly parking price" in 2008 current dollars. Parking costs are assumed to attain $539 per month (in today's dollars) in the San Francisco financial district, and $757 per month in the Chinatown.

The off-peak parking costs (per hour) are higher than the peak parking costs (per hour) since the peak parking costs are based on the discounted monthly parking rates, divided by 22 work days per month, divided by 8 hours per workday. The off-peak parking costs are reflective of mid-day, regular, not discounted parking costs.

Parking costs are a nominal cost in the MTC travel models, as opposed to the "real parking cost" incurred. That is, we are not assuming that xx.x percent of travelers are parking for free in downtown San Francisco. This means that the real (free and non-free weighted) parking costs should be lower than the nominal (posted) parking prices. Since the MTC models were empirically estimated on these nominal parking prices, it is only appropriate to keep nominal parking prices in the model application.

The final documentation for the latest planning assumptions will include the assumed parking costs for the other base and intermediate years (2006, 2007, 2015 and 2025).

b. Auto Operating Costs

This is the most challenging set of forecasting assumptions given the radical and recent escalation of gas prices over the past several months. According to the AAA, today's (5/30/08) gas prices range from $4.18 per gallon of regular unleaded in the North Bay to $4.23 in San Francisco. Just a month ago, gas prices ranged from $3.90 per gallon in the North Bay to $4.00 per gallon in San Francisco [http://www.fuelgaugereport.com/CAmetro.asp]. The United States Energy Information Administration (EIA) is showing national gas prices, for the week of 5/26/08, ranging from a low of $3.83 per gallon in Texas to $4.17 per gallon in Chicago, with a national average of $3.94 per gallon. From May 2007 to May 2008, the average national gas price increased from $3.21 per gallon to $3.94 per gallon, a 23 percent increase in 12 months.
[http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_home_page.html]

To take into account these recent month's gas price increases, we tested several linear regression models based on historical gas prices reported by the US Bureau of Labor Statistics (BLS). Data from

April 1988 through April 2008 was used to produce various regression results, as shown in **Table 2**. Regressions based on 20 years of gas price data (1988-2008) would predict a $4.14/gallon gas price by the year 2035 (in today's dollars). The regression based on the past five years of gas price data (2003-2008) would extrapolate to $11.02/gallon by the year 2035 (again, in today's 2008 dollars).

We are proposing using the 10-year regression model, based on published gas prices from April 1998 through April 2008, for the future year 2035 gas price (see **Figure 1 and 2**). This is $7.47 per gallon in today's dollars. This is comparable to current European petrol prices, which range from $4.70 per gallon in Estonia to $8.43 per gallon in Norway. (The closest to this $7.47 estimate is Germany, currently at $7.64/gallon, or 1.37 euros/liter.)

The other major factor to consider in auto operating costs is the average fuel economy. MTC staff has estimated that the overall Bay Area fuel economy will increase from 19.86 miles per gallon in 2006 to 32.15 miles per gallon in 2035. This is based on staff analysis of EMFAC2007 databases and models supplied by the California Air Resources Board (CARB), and takes into account the Pavley Phase I and Pavley Phase II regulations. In our forecasting work conducted in Fall 2007 for the Vision 2035 analysis, we only had information related to the Pavley Phase I regulations, for which we had estimated a 27.66 overall fuel economy by 2035. Our current revisions show that Pavley Phase I would increase Bay Area fuel economy to 27.91 mpg; and Pavley Phase II would further increase the overall fuel economy to 32.15 mpg. Note that these estimates are for light duty auto (LDA), small light duty trucks under 8,500 pounds (LDT1) and small light duty trucks over 8,500 pounds (LDT2). *(Overall fuel economy assumptions for other intermediate years will be updated between 5/30/08 and 6/09/08, and will be presented at the 6/09/08 meeting).*

The increase in overall fuel economy is a striking 59 percent increase between 2006 and 2035 (see **Table 3**). The increase in fuel economy is almost offset by the 76 percent real increase in gas price assumed between 2008 and 2035, such that the overall auto operating cost per mile is projected to increase by just 10 percent, from 21.00 cents/mile (1990$) to 23.03 cents/mile (1990$). This appears quite reasonable, and may be comparable to European and Japanese-level gasoline prices and fuel economy. *[This will be interesting to check with international energy analysts such as Professor Lee Schipper or Dan Sperling.]*

The following table summarizes the horizon year auto operating cost assumptions used in MTC regional transportation planning activities over the past ten years. It is useful in showing the usefulness and need to re-evaluate latest planning assumptions on an ongoing basis. What was perfectly reasonable perhaps ten years ago appears ludicrous from today's perspective.

Planning Study	Horizon Year	Gas Price (4/08$)	Fuel Economy (mpg)	Gas Price per Mile (4/08$)
1998 RTP	2020	$1.86	21.9	8.5 cents/mile
2001 RTP	2025	$2.26	21.9	10.3
2005 RTP	2030	$2.26	21.9	10.3
Vision 2035	2035	$3.93	27.7	14.2
Current, 2008	*2008*	*$4.20*	*20.1*	*20.9*
2009 RTP	2035	$7.47	32.2	23.2

c. Bridge Tolls

Bridge tolls are not assumed to increase with inflation. So, with an inflation estimate of 2.9 percent per year between today and 2035, the current set of $4.00 tolls on the Bay Area bridges ($5.00 on the Golden Gate), the $4.00 in year 2035 will be worth about $1.90 in today's (2008) dollars.

Tolls for Bay Area bridges, and their 1990 deflated values, are shown in **Table 4**, and graphed in **Figure 3**. Note that the toll is split two ways so that the overall toll cost is not different based on the direction of the commute (i.e., San Francisco to Alameda commuters have no toll in their morning commute, but must pay $4.00 in tolls for their evening commute.)

d. Transit Fares

Transit fares are assumed to increase with inflation. For the year 2035 fares we are proposing using transit fares in effect June 1, 2008. Transit fares are then deflated to 1990 constant dollars using the ratio of the 1990 CPI-U for the Bay Area (132.1) to the April 2008 CPI-I for the Bay Area (222.1), for use in the travel model system, where all costs are represented in 1990 constant dollars.

Transit fares as used for the past several regional transportation plans are summarized in **Table 5**. The fare values shown in Table 5 are in current year dollars.